Published for SISSA by Springer

Received: *August 3, 2016*
Accepted: *August 3, 2016*
Published: *August 10, 2016*

Erratum: CP asymmetry in heavy Majorana neutrino decays at finite temperature: the nearly degenerate case

S. Biondini,[a] N. Brambilla,[a,b] M.A. Escobedo[c] and A. Vairo[a]

[a] *Physik-Department, Technische Universität München, James-Franck-Str. 1, 85748 Garching, Germany*
[b] *Institute for Advanced Study, Technische Universität München, Lichtenbergstrasse 2 a, 85748 Garching, Germany*
[c] *Institut de Physique Thèorique, Université Paris Saclay, CNRS, CEA, F-91191 Gif-sur-Yvette, France*

E-mail: simone.biondini@tum.de, nora.brambilla@tum.de, miguel-angel.escobedo-espinosa@cea.fr, antonio.vairo@tum.de

Erratum to: JHEP03(2016)191

ArXiv ePrint: 1511.02803

We correct an error in the SU(2) part of (B.25), (B.26), (B.27). The equations should read

$$\mathrm{Im}\,(-i\mathcal{D}^{\ell}_{3,\mathrm{fig.23}}) + \mathrm{Im}\,(-i\mathcal{D}^{\ell}_{4,\mathrm{fig.23}}) = -\frac{\mathrm{Im}\left[(F_1^*F_2)^2\right]}{(16\pi)^2 M}\frac{g'^2}{4}\left(1-\frac{\Delta}{M}\right)\delta^{\mu\nu}\delta_{mn}+\dots\,, \tag{B.25}$$

$$\mathrm{Im}\,(-i\mathcal{D}^{\ell}_{1,\mathrm{fig.24}}) + \mathrm{Im}\,(-i\mathcal{D}^{\ell}_{2,\mathrm{fig.24}}) = -\frac{\mathrm{Im}\left[(F_1^*F_2)^2\right]}{(16\pi)^2 M}\frac{g'^2}{4}\left(-1+\frac{\Delta}{M}\right)\delta^{\mu\nu}\delta_{mn}+\dots\,, \tag{B.26}$$

$$\mathrm{Im}\,(-i\mathcal{D}^{\ell}_{3,\mathrm{fig.24}}) + \mathrm{Im}\,(-i\mathcal{D}^{\ell}_{4,\mathrm{fig.24}}) = -\frac{\mathrm{Im}\left[(F_1^*F_2)^2\right]}{(16\pi)^2 M}\frac{g'^2}{4}\left(1-\frac{\Delta}{M}\right)\delta^{\mu\nu}\delta_{mn}+\dots\,. \tag{B.27}$$

Note that the contributions from the SU(2) gauge bosons vanish for the diagrams of figure 23 and 24. The error influences our final results in the parts depending on the SU(2) gauge coupling g. Equations (4.1) and (4.2) for the matching coefficients should read

$$\begin{aligned}\mathrm{Im}\,a^{\ell}_{11} = -\,\mathrm{Im}\,a^{\bar\ell}_{11} = \frac{\mathrm{Im}\left[(F_1^*F_2)^2\right]}{(16\pi)^2}\Bigg\{&6\lambda\left[1+\ln 2-(2-\ln 2)\frac{\Delta}{M}\right]\\ &-\frac{3}{8}g^2\left[2-\ln 2+(3-5\ln 2)\frac{\Delta}{M}\right]-\frac{g'^2}{8}\left[4-\ln 2+(1-5\ln 2)\frac{\Delta}{M}\right]\Bigg\}\,,\end{aligned} \tag{4.1}$$

$$\begin{aligned}\mathrm{Im}\,a^{\ell}_{22} = -\,\mathrm{Im}\,a^{\bar\ell}_{22} = -\frac{\mathrm{Im}\left[(F_1^*F_2)^2\right]}{(16\pi)^2}\Bigg\{&6\lambda\left[1+\ln 2+(2-\ln 2)\frac{\Delta}{M}\right]\\ &-\frac{3}{8}g^2\left[2-\ln 2-(3-5\ln 2)\frac{\Delta}{M}\right]-\frac{g'^2}{8}\left[4-\ln 2-(1-5\ln 2)\frac{\Delta}{M}\right]\Bigg\}\,.\end{aligned} \tag{4.2}$$

doi:10.1007/JHEP08(2016)072

As a consequence, equations (5.2), (5.3) and (5.6) for the unflavoured case should be

$$
\begin{aligned}
\Gamma^{\ell,T}_{11,\text{direct}} - \Gamma^{\bar\ell,T}_{11,\text{direct}} = \frac{\mathrm{Im}\left[(F_1^* F_2)^2\right]}{64\pi^2} \Bigg\{ & \lambda \left[1 + \ln 2 - (2 - \ln 2)\,\frac{\Delta}{M}\right] \\
& - \frac{g^2}{16}\left[2 - \ln 2 + (3 - 5\ln 2)\,\frac{\Delta}{M}\right] \\
& - \frac{g'^2}{48}\left[4 - \ln 2 + (1 - 5\ln 2)\,\frac{\Delta}{M}\right]\Bigg\}\frac{T^2}{M}\,, \qquad (5.2)
\end{aligned}
$$

$$
\begin{aligned}
\epsilon^T_{1,\text{direct}} = \frac{\mathrm{Im}\left[(F_1^* F_2)^2\right]}{8\pi |F_1|^2}\left(\frac{T}{M}\right)^2 \Bigg\{ & \lambda \left[2 - \ln 2 + (1 - 3\ln 2)\,\frac{\Delta}{M}\right] \\
& - \frac{g^2}{16}\left[2 - \ln 2 + (3 - 5\ln 2)\,\frac{\Delta}{M}\right] \\
& - \frac{g'^2}{48}\left[4 - \ln 2 + (1 - 5\ln 2)\,\frac{\Delta}{M}\right]\Bigg\}, \qquad (5.3)
\end{aligned}
$$

$$
\begin{aligned}
\epsilon^T_{2,\text{direct}} = -\frac{\mathrm{Im}\left[(F_1^* F_2)^2\right]}{8\pi |F_2|^2}\left(\frac{T}{M}\right)^2 \Bigg\{ & \lambda \left[2 - \ln 2 - (9 - 5\ln 2)\,\frac{\Delta}{M}\right] \\
& - \frac{g^2}{16}\left[2 - \ln 2 - 7\,(1 - \ln 2)\,\frac{\Delta}{M}\right] \\
& - \frac{g'^2}{48}\left[4 - \ln 2 - (9 - 7\ln 2)\,\frac{\Delta}{M}\right]\Bigg\}, \qquad (5.6)
\end{aligned}
$$

and similarly equations (7.9) and (7.10) for the flavoured case should read

$$
\begin{aligned}
\epsilon^T_{f1,\text{direct}} = {} & \frac{\mathrm{Im}\left[(F_1^* F_2)(F_{f1}^* F_{f2})\right]}{8\pi |F_1|^2}\left(\frac{T}{M}\right)^2 \Bigg\{\lambda \left[2 - \ln 2 + (1 - 3\ln 2)\,\frac{\Delta}{M}\right] \\
& - \frac{g^2}{16}\left[2 - \ln 2 + (3 - 5\ln 2)\,\frac{\Delta}{M}\right] - \frac{g'^2}{48}\left[4 - \ln 2 + (1 - 5\ln 2)\,\frac{\Delta}{M}\right]\Bigg\}, \qquad (7.9)
\end{aligned}
$$

$$
\begin{aligned}
\epsilon^T_{f2,\text{direct}} = {} & -\frac{\mathrm{Im}\left[(F_1^* F_2)(F_{f1}^* F_{f2})\right]}{8\pi |F_2|^2}\left(\frac{T}{M}\right)^2 \Bigg\{\lambda \left[2 - \ln 2 - (9 - 5\ln 2)\,\frac{\Delta}{M}\right] \\
& - \frac{g^2}{16}\left[2 - \ln 2 - 7\,(1 - \ln 2)\,\frac{\Delta}{M}\right] - \frac{g'^2}{48}\left[4 - \ln 2 - (9 - 7\ln 2)\,\frac{\Delta}{M}\right]\Bigg\} \\
& + \frac{\mathrm{Im}\left[(F_1 F_2^*)(F_{f1}^* F_{f2})\right]}{2\pi |F_2|^2}\left(\frac{T}{M}\right)^2 \lambda\frac{\Delta}{M}\,. \qquad (7.10)
\end{aligned}
$$